

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE 03/01127

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC7: C12N 15/10, C07H 1/06, C07H 1/08 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
IPC7: C12N, C07H, C12Q		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPO-INTERNAL, WPI-DATA, PAJ, BIOSIS, MEDLINE, CHEM. ABS DATA, EMBASE		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Biopolymers (Nucleic Acid Sciences, Vol. 52, 1999, Vladimir A. Izumrudov et al: "Controllable Stability of DNA-Containing Polyelectrolyte Complexes in Water-Salt Solutions", page 97, right column, paragraph 3, page 98, right column, page 99, figure 3	1-3,10
Y	--	1-17
X	Biopolymers, Volume 31, 1991, Alexander V. Kabanov et al: "DNA Interpolyelectrolyte Complexes as a Tool for Efficient Cell Transformation", page 1437 - page 1443, page 1439, left column	1-3,10
Y	--	1-17
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
6 October 2003		07 -10- 2003
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86		Authorized officer  Sara Nilsson/EÖ Telephone No. + 46 8 782 25 00

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4055469 A (ROY EUGENE SNOKE ET AL), 25 October 1977 (25.10.77), see especially column 4, lines 39-51, column 5, lines 36-41, column 7, lines 30-34, column 8, lines 13-15, column 9, lines 24-32  --	1-17
Y	EP 1031626 A1 (QIAGEN GMBH), 30 August 2000 (30.08.00), abstract, page 4, line 18 - page 5, line 26 and page 38, claim 28  --	1-17
A	Macromol. Biosci., Volume 2, no. 2, 2002, Alexander N. Zelikin et al: "Polyelectrolyte complexes Formed by Calf Thymus DNA and Aliphatic Ionenenes: Unexpected Change in Stability upon Variation of Chain Length of Ionenenes of Different Charge Density", page 78 - page 81, page 81, right column, paragraph 2  --	1-17
A	EP 0281390 A2 (LYLE, J. ARNOLD JR.), 7 Sept 1988 (07.09.88), page 6, lines 52-61, page 7, line 85 - page 8, line 7, page 17, example 15  --	1-17
A	US 2002010145 A1 (RICHARD C. WILLSON, III ET AL), 24 January 2002 (24.01.02)  --	1-16
A	Biotechnology Techniques, Volume 12, no. 8, August 1998, D. K. Ramsden et al: "Flocculation of cellular material in complex fermentation medium with the flocculant poly(diallyldimethylammonium chloride)", page 599 - page 603  --	1-16
A	US 5010183 A (DONALD E. MACFARLANE), 23 April 1991 (23.04.91), column 2, lines 48-52, column 3, lines 24-36  --	1-16

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>BIOSIS, accession no. PREV199396107533, Cihlar Tomas et al: "Efficient separation of natural ribonucleotides by low-pressure anion-exchange chromatography"; &amp; Journal of Chromatography, 1993, vol. 644, no. 2, pages 299-305</p> <p style="text-align: center;">-- -----</p>	1-17

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## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☒ Claims Nos.: **1-9, 11-17 all partially**  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
  
**see next sheet**
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

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PCr/SE03/01127

Due to the expression "a highly charged linear polymer that comprises quaternary amino groups", present claim 1 (and dependent claims 2-8 and 10-17) relate to an extremely large number of possible methods. Support within the meaning of Article 6 PCT is to be found, however, for only a very small proportion of the methods claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Consequently, the search has been focused on those parts of the claims which appear to be supported and disclosed, namely those parts related to a method involving the precipitating agents used in the examples of the description (poly(N',N'-dimethyldiallylammonium chloride)) and the agents mentioned in present claim 10. An attempt has also been made to search for the general aspects of precipitation of nucleic acid with a highly charged linear polymer that comprises quaternary amino groups.

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Patent document cited in search report			Publication date	Patent family member(s)		Publication date
US	4055469	A	25/10/77	CA	1095446 A	10/02/81
				DE	2755034 A,C	15/06/78
				FR	2387243 A,B	10/11/78
				GB	1590310 A	28/05/81
				JP	1112710 C	16/09/82
				JP	53072891 A	28/06/78
				JP	56051749 B	08/12/81
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EP	1031626	A1	30/08/00	JP	2000342259 A	12/12/00
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				AT	107654 T	15/07/94
				AU	618951 B	16/01/92
				AU	1426988 A	26/09/88
				DE	3850273 D,T	29/09/94
				DK	607588 A	28/12/88
				ES	2054797 T	16/08/94
				FI	885022 A	01/11/88
				JP	1502319 T	17/08/89
				JP	2862547 B	03/03/99
				KR	9600479 B	08/01/96
				NO	884847 A	22/12/88
				PT	86881 A	30/03/89
				US	5599667 A	04/02/97
				WO	8806633 A	07/09/88
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US	2002010145	A1	24/01/02	NONE		
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US	5010183	A	23/04/91	NONE		
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